

# **Exhibit 6**

**HIGHLY CONFIDENTIAL: SUBJECT TO PROTECTIVE ORDER**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF OHIO EASTERN DIVISION**

IN RE NATIONAL PRESCRIPTION  
OPIATE LITIGATION

*County of Summit, Ohio, et al.*

v.

*Purdue Pharma L.P., et al.*

*The County of Cuyahoga*

v.

*Purdue Pharma L.P., et al.*

CASE NO. 1:17-MD-2804

JUDGE POLSTER

TRACK ONE CASES

**EXPERT REPORT OF PROFESSOR MARGARET K. KYLE**

**May 10, 2019**

Expert Report of Margaret K. Kyle, PhD

**Rosenthal**, and I would not want to -- it wouldn't make economic sense to include them in this model.<sup>332</sup>

- (177) In contrast, Professor Rosenthal describes her analysis as measuring “the extent to which the sale of **prescription** opioids...was caused by any quantum of the Defendants’ promotional efforts that counsel can prove was unlawful.”<sup>333</sup> She relies on IQVIA NPA data, which “tracks sales of prescription drugs in retail outlets.”<sup>334</sup> Because of this, her analysis appropriately does not consider “stolen or...borrow[ed]” opioid shipments unrelated to defendant promotion as part of her percentage.<sup>335</sup>
- (178) Professor Cutler also acknowledges that the difference in measurement could affect his regression coefficient, depending on whether non-prescription shipments are associated with more harms, but incorrectly believes he lacks the data to test this.<sup>336</sup>

Q. So what if -- what if we convert the prescriptions to milligram equivalents, milligram morphine equivalents, my question is, if you had run your direct regression using prescription activity, do you believe that it would result in substantially the same coefficient in relation to driving opioid mortality?

A. I don't want to hazard a guess as to what the coefficient would be. In general -- and I also want -- would want to compare the two series. The ARCOS data includes, I believe it is six different categories of where drugs are shipped to. The prescriptions may only capture one of those areas or potentially more than one. In order to judge those two, which, first off, I don't -- I don't have an econometric way to estimate whether they would be similar. But in order to judge those two, **what I would want to see is which one is picking up more of what we think would be the shipments that would be associated with harms, those that come from prescriptions themselves or those that come from all shipments to all the retail categories that are picked up in ARCOS.**<sup>337</sup>

<sup>332</sup> Deposition of David Cutler, April 27, 2019 [hereinafter “Cutler April 27 Dep.”] at 522:22-524:2 (objections omitted) (emphasis added).

<sup>333</sup> Rosenthal Rep. ¶ 11 (emphasis added).

<sup>334</sup> Rosenthal Rep. ¶ 51.

<sup>335</sup> To illustrate the effect of this misunderstanding, consider a hypothetical scenario in which 25% of shipments are “stolen or...borrow[ed]” and Professor Rosenthal’s percentage impact attributable to alleged misconduct is 50%. If that percentage impact were of shipments, 50% of shipments would be attributed to defendant misconduct. But because that percentage impact is of prescriptions, only 37.5% of shipments are attributed to defendant misconduct (50% \* 75%), with an additional 25% having been removed as non-prescription product that is unrelated to promotional activity.

<sup>336</sup> Cutler April 27 Dep. at 647:24–648:7

<sup>337</sup> Cutler April 27 Dep. at 645:1-646:3 (objections omitted) (emphasis added).

- (179) Figure 49 reproduces Professor Cutler's Figure III.10 from his report that shows that his measured "Percent Impact on Mortality" ranges from 21.1%–25.9% over the period 2006–2010. In Figure 50, I recreate Professor Cutler's impact percentages by running his model using IQVIA *prescription* data measured in MMEs instead of shipments. Without attempting to correct any other flaws and without conceding that his regression model appropriately supports a causal conclusion with respect to any measured variable (it does not), substituting prescription data alone reduces his impact percentages by almost half, to a range between 12.5% and 15.7%.<sup>338</sup>

**Figure 49: Professor Cutler's Figure III.10**

Year	Actual Mortality	Cumulative Average Shipments	But-For Cumulative Average Shipments	Shipment Coefficient from Regression	Impact on Mortality  <i>E = (B-C) *</i>	But-For Mortality	Percent Impact on Mortality
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>D</i>	<i>F = A - E</i>	<i>G = E / A</i>
2006	9.97	1.12	0.64	4.39	2.10	7.87	<b>21.1%</b>
2007	10.51	1.21	0.67	4.39	2.34	8.17	<b>22.3%</b>
2008	11.06	1.29	0.70	4.39	2.57	8.49	<b>23.3%</b>
2009	11.45	1.37	0.73	4.39	2.79	8.66	<b>24.4%</b>
2010	11.66	1.45	0.76	4.39	3.02	8.64	<b>25.9%</b>

<sup>338</sup> I do not extend this adjustment to Professor Cutler's analysis to the period beyond 2010, as he no longer attempts to estimate a direct relationship between opioid MMEs and prescribing during those years. He does provide a framework for extending his effect on *licit* opioids post-2010 by inexplicably assuming the relationship between cumulative average opioid MMEs and total opioid mortality can be applied to licit mortality, but that assumption is inconsistent with his own analysis that attempts to relate the reduction in opioid MMEs post-2010 to a shift from licit to illicit mortality.

**Figure 50: Professor Cutler's Figure III.10, corrected to utilize prescriptions (MMEs dispensed in the retail channel)**

Year	Actual Mortality	Cumulative Average Prescriptions	But-For Cumulative Average Prescriptions	Prescription Coefficient from Regression	Impact on Mortality	But-For Mortality	Percent Impact on Mortality
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	$E = (B - C) * D$	$F = A - E$	$G = E / A$
2006	9.97	1.02	0.58	2.82	1.24	8.72	<b>12.5%</b>
2007	10.51	1.10	0.61	2.82	1.38	9.13	<b>13.2%</b>
2008	11.06	1.18	0.64	2.82	1.53	9.53	<b>13.8%</b>
2009	11.45	1.26	0.67	2.82	1.67	9.78	<b>14.6%</b>
2010	11.66	1.36	0.71	2.82	1.83	9.83	<b>15.7%</b>

## **VI.G. Plaintiffs' experts' combined damages framework is incapable of demonstrating that Allergan contributed to the alleged harm**

- (180) As I have described throughout this report, Plaintiffs' experts combine a long chain of unrelated national, state, and county-level estimates, measured at different points in time, and reliant on different types of measures, to reach a precise damages number for Cuyahoga and Summit counties. For example, Professor Cutler relies on several key inputs to arrive at his conclusions, as explained in the equation presented on page 12 of his expert report. The estimate of the share of opioid shipments caused by defendant misconduct comes directly from Professor Rosenthal's analysis, which is fatally flawed. The estimate of the share of opioid harms attributed to opioid shipments is based on his estimated relationship between opioid shipments and opioid mortality, which is also problematic. It is inappropriate to assume that the same relationship holds for all other types of harm, and even if it did, the estimates post-2010 are especially suspect.
- (181) Plaintiffs fail to consider any measure of error and omit critical pieces of the causal chain in such a way as to invalidate any precise dollar amount they purport to measure as harm. In fact, Plaintiffs' own sensitivities show that these calculations can encompass a wide range of estimates. Professor Cutler acknowledged as much in his deposition testimony, criticizing the application of his models to a single county:

That's why as an econometrician **you wouldn't use the analysis of this to predict for a single county**, but rather one wants to use this to develop an estimate for the set of counties as a whole because that's what this -- this is what is describing the vast --

the average county in the data set, and that's what that regression coefficient is giving, and, therefore, it's appropriate to evaluate it at the average in the data set.<sup>339</sup>

Indeed, Professor Cutler testified that he would "need a different type of model entirely in order to estimate a coefficient for a single county."<sup>340</sup> Yet the economic framework employed by Plaintiffs' experts relies on Professor Cutler's average model precisely to do exactly that, predicting exact harm to Cuyahoga and Summit counties while offering no measure of error. In the remainder of this section, I provide additional examples of areas that Plaintiffs' experts' estimates propagate imprecision and uncertainty, the totality of which prevents them from offering a reliable estimate of harm to Cuyahoga and Summit counties.

- Both in their individual analyses and in combining their calculations, Plaintiffs' experts inappropriately multiply several different units of measurement together. For example, Professor Cutler combines his purported relationship between opioid *shipments* and mortality with Professor Rosenthal's purported relationship between manufacturer detailing and *prescription-based MMEs*. As I demonstrate in Section VI.F, substituting *prescription-based MMEs* for *shipments* (without correcting any of the other flaws in Professor Cutler's model) reduces his estimated harm by nearly half.
- Professor Cutler fails to account for differences in products when measuring harm. In his analysis, Professor Cutler assumes that the harm associated with different opioid products is all the same and that he does not need to weight his analysis in any way:

Q. So I'm focused on shipments that you did include in your analysis. Other than making the conversion for morphine milligram equivalents, you treated all opioid medicines as if they were the same, right?

A. Yes. Once drugs had been converted to milligrams of morphine equivalent, and once we had decided on which drugs to include, then all drugs contributed equally, and we looked at the milligrams of morphine equivalency as a whole.<sup>341</sup>

This creates two issues with his analysis. First, the assumption that the harm associated with different products is constant could be aggressive. It is conceivable that different types of opioids (both licit and illicit) contributed to harms differently. It is therefore inappropriate to assume that Allergan (which only sold particular types of branded opioids) is equally responsible for the harm associated with all types of opioid products. Second, because Professor Cutler does not take products into account in his harm calculations, it is impossible to attribute the harm to any

<sup>339</sup> Cutler April 27 Dep. at 533:20–534:5.

<sup>340</sup> Cutler April 27 Dep. at 529:11–13.

<sup>341</sup> Cutler April 26 Dep. at 62:9–19 (objections omitted)